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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/580,336

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Shun Takahashi

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EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT

PAPER NUMBER

1796

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,336	Applicant(s) TAKAHASHI ET AL.	
	Examiner Katarzyna Wyrozebski	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/24/06</u> . | 6) <input type="checkbox"/> Other: ____. |

Claim Objections

1. Claims are objected to because of the following informalities as follows:

Claim 1 is not clear, is the silyl group bonded to the organosilicate or alkyl? If it is alkyl group then there will be no bonding and applicant's claim will be subject to 112nd paragraph rejection. Alkyls will not bind to the silicate unless substituted or otherwise modified

Claim 5, the applicants are citing term "atomic group" which is well defined in the art and its not what claim recites. The species listed in claim 5 are either substituents or functional groups not atomic groups.

Appropriate correction is required.

Term substituted in not rejected as 112, since the meaning of term substituted is defined in the specification and claims as originally filed.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re*

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Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-10 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 11/628625 ('625). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following explanation.

Co-pending application claims a biodegradable article comprising a nanocomposite composition. The composition comprises biodegradable polyester based resin and organo clay. Organoclay of the co-pending application is defined as one treated with ammonium compound and silyl compound.

Although the definition of silyl compound is not disclosed in claims, applicants attention is drawn to MPEP 804 where it is disclosed that "the specification can always be used as a dictionary to learn the meaning of a term in a patent claim." *In re Boylan*, 392 F.2d 1017, 157 USPQ 370 (CCPA 1968). Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. (underlining added by examiner for emphasis) *In re Vogel*, 422 F.2d 438, 164 USPQ 619, 622 (CCPA 1970).

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Consistent with the above underlined portion of the MPEP citation, attention is drawn to paragraph [0025-0026], which provides definition of silyl group according to the requirements of the instant invention.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention, that while practicing the claims of co-pending invention one would also arrive at instant claims. It is also true that if one of ordinary skill in the art would practice the claims of instant invention, co-pending claims would also be attained.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over MOHANTY (US 2003/0216496) in view of SUZUKI (US 6,583,208).

The prior art of MOHANTY discloses composition for environmentally friendly polylactide based composite, which composite comprises modified silicates. The composition of MOHANTY is utilized to make various molding products such as sheets.

Polylactic based polymer is defined in paragraph [0022-0024] of the prior art. Optionally other polymers can also be utilized as long as they do not negatively impact biodegradability of lactide polymer. These polymers are listed in [0026].

Clays are described in [0059-0061]. They are swellable smectite based clays that are modified. Modification includes ammonium based compound, which improves compatibility of layered silicates with polymeric matrix, and coupling agent, which improves adhesion properties between clay platelets and polymeric matrix.

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The prior art of MOHANTY is silent with respect to the types of coupling agents suitable for use with clays and polyesters.

With respect to the above difference, the prior art of SUZUKI more than adequately discloses silane coupling agents that are suitable for that particular purpose. Specifically, the prior art of SUZUKI discloses polyesters filled with exfoliated modified clay.

Silane coupling agents of SUZUKI are silane compounds comprising at least one alkyl group "Y" having 1-25 carbon atoms (Abstract). The "Y" group of SUZUKI is also substituted. The definition of "Y" group can be found in col. 7-8 of the prior art of SUZUKI. The silanes of SUZUKI satisfy requirement of the instant invention, especially when the silane can have up to 3 alkyl substitutions. Functionalities on the alkyl group include amino, epoxy, vinyl, mercapto, cyano, hydroxy, carboxy and the like.

The prior art of SUZUKI shows examples of silane coupling agents, which are suitable for use in compositions comprising polyesters and exfoliated clay. Silane coupling agents, when utilized in compositions comprising polyesters and layered silicates do not negatively affect the abilities of clay to intercalate and exfoliate, in fact they add to the swelling and increase of the basal spacing. In addition, as mentioned above, due to presence of functional groups, coupling agents increase the adhesion properties between clay platelets and matrix polyester.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize coupling agents of SUZUKI as the coupling agents generally mentioned by the teachings of MOHANTY and thereby obtain the claims invention. Resulting composition would still provide exfoliated clay with excellent mechanical properties.

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8. Claims 1-8, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over HAYES (US 2004/0024102) in view of SUZUKI (US 6,239,195).

The prior art of HAYES discloses biodegradable composition comprising aliphatic-aromatic polyesters, which polyesters are sulfonated and nanoclay. The composition is utilized to make films and containers that are biodegradable.

The clays specifically are listed in paragraph [0049] of HAYES and include swellable clays that are organically treated with ammonium compounds (see particular examples below) and further surface treated with silane coupling agents to increase adhesion between clay platelets and matrix polymer.

The prior art of HAYES is silent with respect to the specific types of silane coupling agents that are suitable for use in polyester/clay nanocomposites.

With respect to the above difference, the prior art of SUZUKI more than adequately discloses silane coupling agents that are suitable for that particular purpose. Specifically, the prior art of SUZUKI discloses polyesters filled with exfoliated modified clay.

Silane coupling agents of SUZUKI are silane compounds comprising at least one alkyl group "Y" having 1-25 carbon atoms (Abstract). The "Y" group of SUZUKI is also substituted. The definition of "Y" group can be found in col. 7-8 of the prior art of SUZUKI. The silanes of SUZUKI satisfy requirement of the instant invention, especially when the silane can have up to 3 alkyl substitutions. Functionalities on the alkyl group include amino, epoxy, vinyl, mercapto, cyano, hydroxy, carboxy and the like.

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The prior art of SUZUKI shows examples of silane coupling agents, which are suitable for use in compositions comprising polyesters and exfoliated clay. Silane coupling agents, when utilized in compositions comprising polyesters and layered silicates do not negatively affect the abilities of clay to intercalate and exfoliate, in fact they add to the swelling and increase of the basal spacing. In addition, as mentioned above, due to presence of functional groups, coupling agents increase the adhesion properties between clay platelets and matrix polyester.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize coupling agents of SUZUKI as the coupling agents generally mentioned by the teachings of MOHANTY and thereby obtain the claims invention. Resulting composition would still provide exfoliated clay with excellent mechanical properties.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski whose telephone number is (571) 272-1127. The examiner can normally be reached on Mon-Thurs 8:30 AM-2:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katarzyna Wyrozebski/
Primary Examiner, Art Unit 1796
October 22, 2008